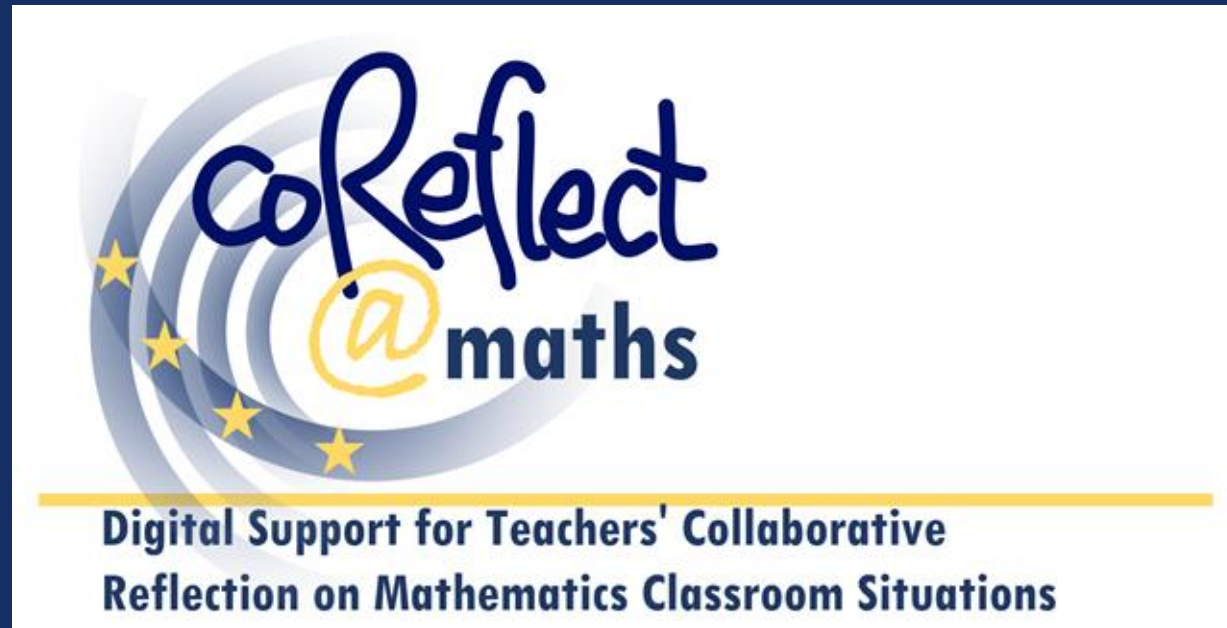


# Pre-service teachers learn to analyse students' problem-solving strategies with cartoon vignettes



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## Theoretical Background

- ❖ Mathematical problem solving is a core mathematical activity and can be supported by the flexible use of problem-solving strategies (Verschaffel et al., 1999; Liljedahl et al., 2016).
- ❖ Prospective teachers have to learn about different strategies, how students apply them to problem solving tasks and where students might struggle (Elia et al., 2009).
- ❖ Vignettes as representations of practice provide the opportunity to engage in classroom situations without the pressure to act: develop situated professional knowledge; analyse classroom interaction, discuss and reflect on alternative approaches (Jeffries & Maeder, 2005).
- ❖ **Cartoon vignettes** can be purposefully designed to represent relevant aspects of practice and theory on different levels of complexity (e.g., regarding context information) (Friesen & Kuntze, 2018).

## Research interest

- ❖ How can cartoon vignettes **support prospective teachers' learning** about students' use of different problem-solving strategies? How do pre-service teachers perceive the **potential of cartoon vignettes** in terms of their professional learning?

## Sample, methods and findings

- ❖ The study was conducted in a one-semester university course with  $N = 42$  pre-service teachers.
- ❖ We provided two types of cartoon vignettes as learning material (please see samples below).
- ❖ Course evaluation: based on the analysis of a complex cartoon (pre-post) and a questionnaire.
- ❖ The participants perceived the cartoon vignettes as **valuable learning opportunities**.
- ❖ Pre-service teachers' analysing results were more often correct when they linked them to specific events in a classroom situation => providing evidence needs **specific support** (Friesen et al., 2022)

## The project coReflect@maths

Erasmus+ Strategic Partnership:

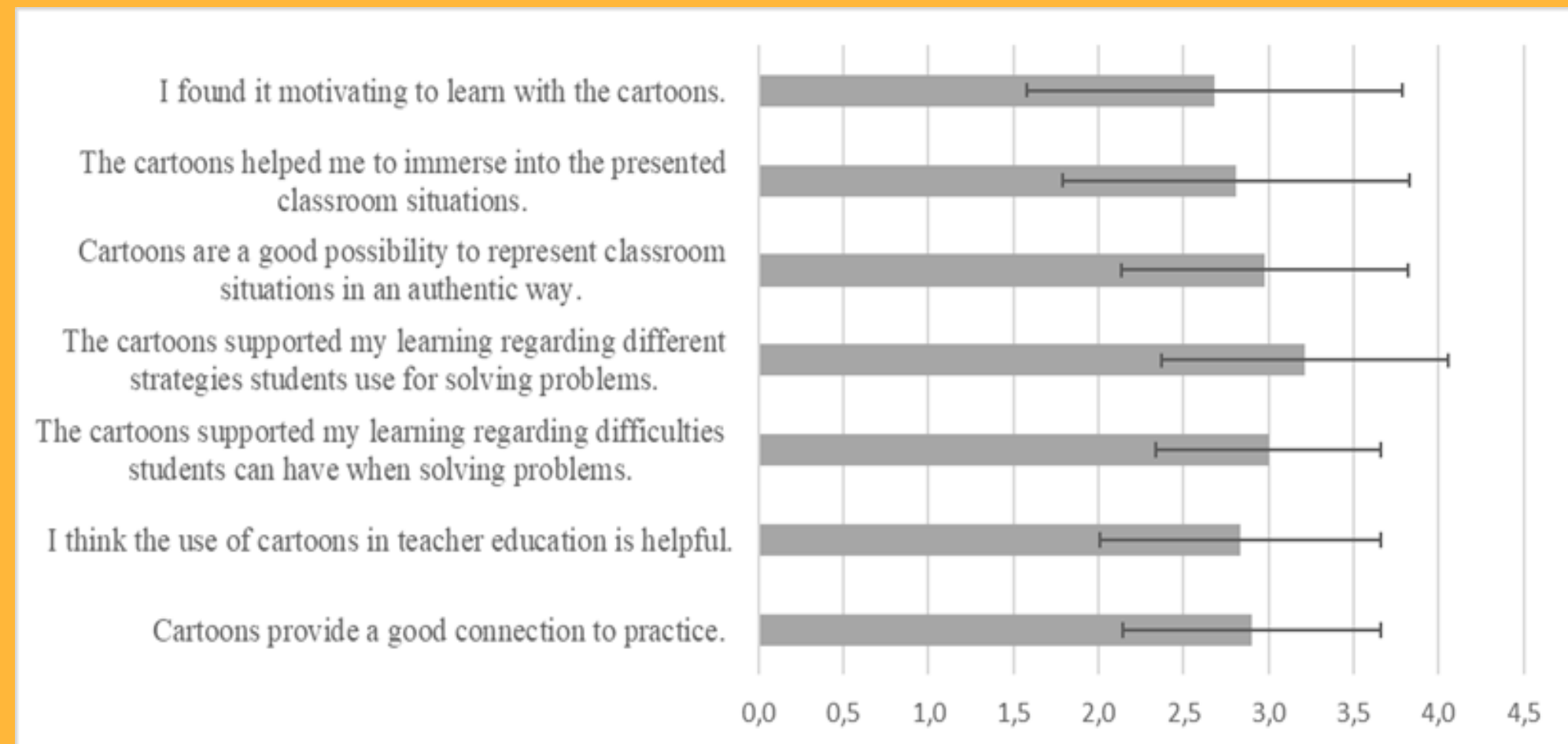
Six partner universities from four countries

## Project goals

- Bringing together and exchanging the practice of vignette-based professional learning
- Developing vignette-based course concepts for teacher students and teacher educators
- Developing DIVER: a digital tool for the creation of cartoon vignettes

[www.coreflect.eu](http://www.coreflect.eu)

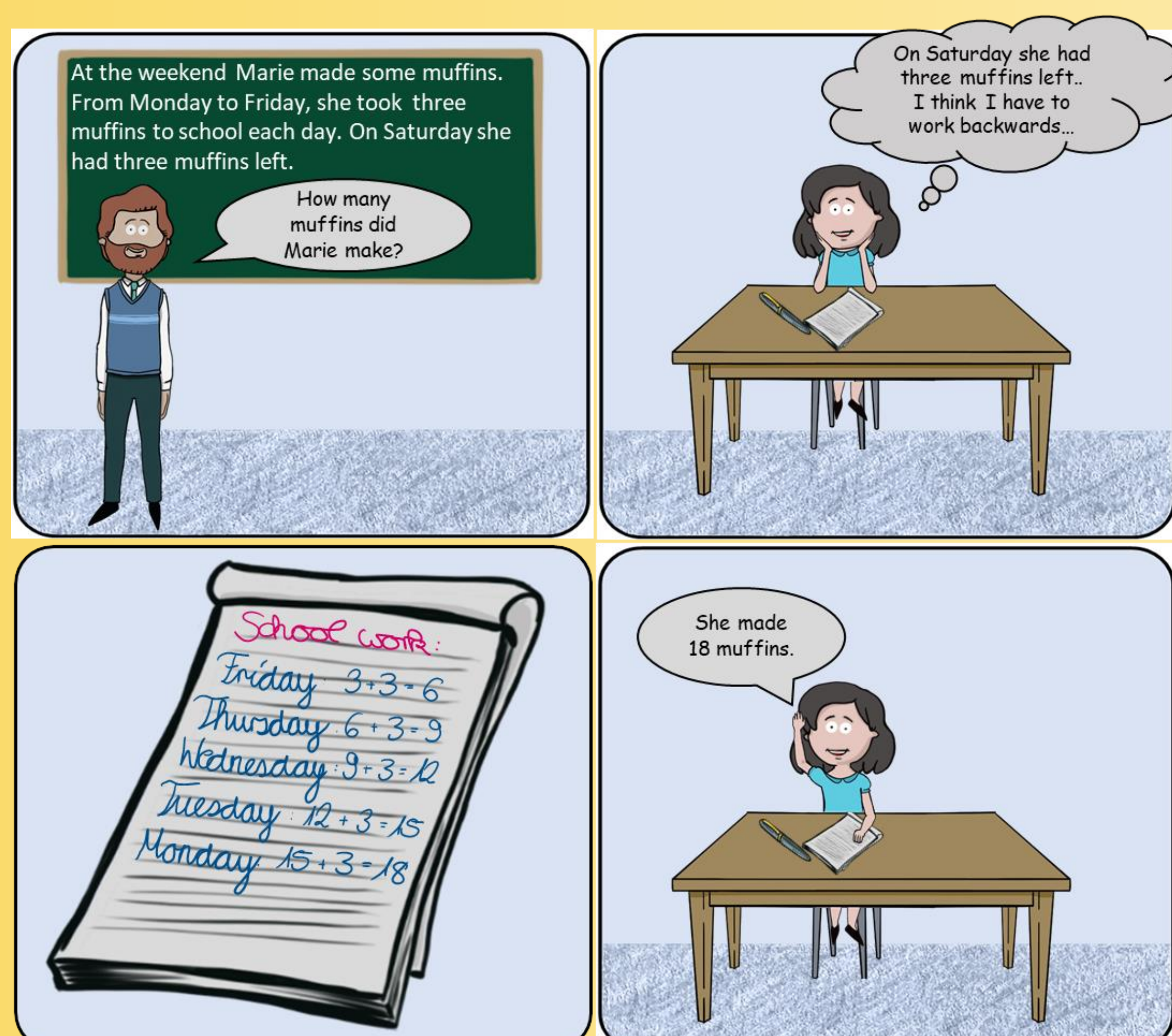
## Findings: Pre-service teachers perceive cartoons as valuable learning opportunities.



## Short cartoon vignettes

illustrating different problem-solving strategies

16 of such short cartoon vignettes were used in the course  
**aim:** develop professional knowledge about different problem-solving strategies used by primary-school children;  
 here: "work backwards"

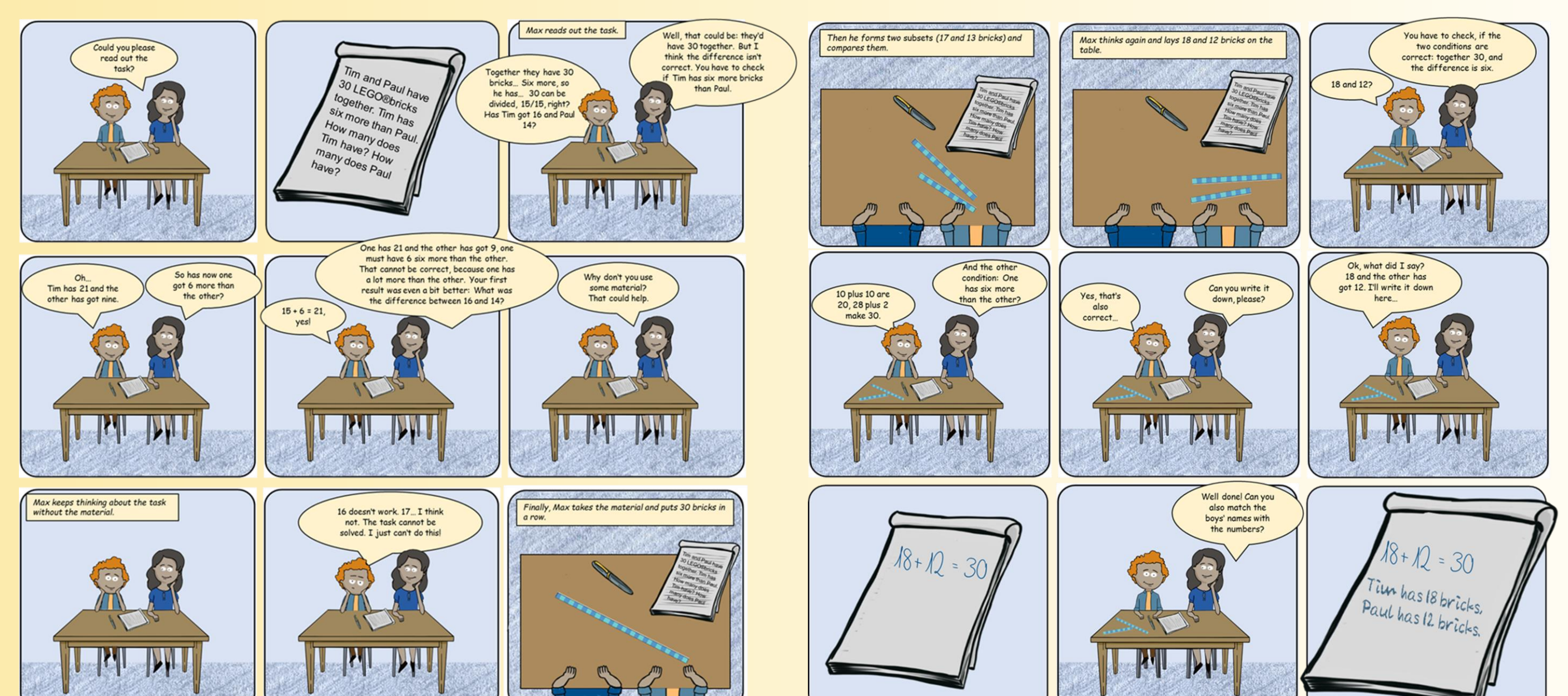


Sample cartoon designed by Alyssa Knox based on Hearing (2016); cartoon characters drawn by Michael Weninger

## Complex cartoon vignettes

illustrating different strategies and need for learning support

four of such more complex cartoons were used in the course  
**aim:** identify strategies used by the students and evaluate their potential for solving the task; assume reasons for students' difficulties; evaluate the teacher's support and develop alternative approaches



Sample cartoon designed by Alyssa Knox based on Rasch (2016); cartoon characters drawn by Michael Weninger

## Pre-service teachers' sample answers showing correctly identified strategies based on evidence from the classroom situation

- (...)"Try systematically" as he goes through examples in order (first 16, then 17, then 18) and comes to a result this way (PST #2)
- (...)"Look for a pattern" as he always has to check for two numbers (difference 6 and result 30) (PST #2)

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